

**CARGILL**  
**SALT DIVISION**

916 S. Riverside Ave.  
St. Clair, MI 48079-5335  
810/326-2700

June 30, 1999

Dermott Courtney  
Underground Injection Control Section  
U. S. Environmental Protection Agency Region 2  
290 Broadway  
New York, New York 10007-1866

Ref: UIC Permit NYU105431 - MIT Reports

Dear Mr. Courtney:

Water-brine interface tests were conducted on three wells, designated 13, 14, and 16, at our Watkins Glen brinefield to demonstrate mechanical integrity in accordance with the subject permit during the past week. All three tests were successful, and the wells have been returned to solution mining service. Reports on the tests are enclosed.

Please call me at 810-326-2762 if you would like additional information, or fax to 810-329-3328.

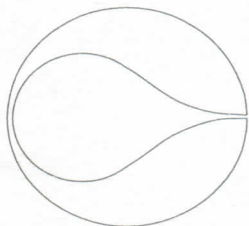
Sincerely,



Michael J. Schumacher  
Solution Mining Manager

enclosures

cc: R. Nemecek, NYDEC  
G. Meyer



DECA-WATKINS COMPL. OR  
59 JUL -9 AM 11:15  
ENVIRONMENTAL PROTECTION  
AGENCY REGION 2

**CARGILL INCORPORATED  
WATER-BRINE INTERFACE  
MECHANICAL INTEGRITY TEST REPORT**

Address

**Cargill Salt  
Watkins Glen Plant  
518 E. 4th Street  
Watkins Glen , New York 14891  
(607) 535-6300**

General Information

|                        |   |
|------------------------|---|
| UIC Permit             | <b>NYU105431</b>  |
| Field                  | <b>Watkins Glen</b>   |
| Test well              | <b>13</b>   |
| Reference well         | <b>16</b>   |
| Other wells in gallery | <b>14</b>   |
| Test well location     | <b>Lat. 42°-23'-05", Long. 76°-51'-46"</b><br><b>Watkins Glen, New York</b> |
| API No.                | <b>31-097-61212</b>   |
| Test Date              | <b>28-Jun-99</b>  |
| Test fluid             | <b>Water</b>  |
| Result                 | <b><u>PASSED TEST</u></b>   |

### Test well data

|   |                  |                     |  |
|---|------------------|---------------------|--|
| Well no.                                      | 13               |                     |  |
| Depth of surface casing                       | 955 ft.          | Drilling record     |  |
| Depth to top of salt formation                | 1743 ft.         | 9/96 gamma ray log  |  |
| Depth to top of cavern                        | 1824 ft.         | 10/96 Sonar caliper |  |
| Depth of production casing                    | 1864 ft.         | 10/96 Sonar caliper |  |
| Depth of tubing (if present)                  | none ft.         |                     |  |
| Total depth                                   | 2156 ft.         | 10/96 Sonar caliper |  |
| Original total depth                          | 2672 ft.         | Drilling record     |  |
| Outer diameter of production casing           | 7 in.            | Drilling record     |  |
| Outer diameter of tubing (if present)         | none in.         |                     |  |
| Capacity of casing or annulus                 | 1.607 gpf        |                     |  |
| Volume of casing or annulus                   | 2995 gals.       |                     |  |
| Normal operating pressure                     | 30 psig          |                     |  |
| Mode of last 24 hours of operation            | Brine production |                     |  |
| All depths referenced to wellhead , elev. 453 |                  |                     |  |

### Reference well data

|   |            |                     |  |
|---|------------|---------------------|--|
| Well no.                                      | 16         |                     |  |
| Depth of surface casing                       | 1099 ft.   | Drilling record     |  |
| Depth to top of salt formation                | 1740 ft.   | 9/96 gamma ray log  |  |
| Depth to top of cavern                        | 1790 ft.   | 10/96 Sonar caliper |  |
| Depth of production casing                    | 1878 ft.   | 10/96 Sonar caliper |  |
| Depth of tubing (if present)                  | none ft.   |                     |  |
| Total depth                                   | 2174 ft.   | 10/96 Sonar caliper |  |
| Original total depth                          | 2694 ft.   | Drilling record     |  |
| Outer diameter of production casing           | 7 in.      | Drilling record     |  |
| Outer diameter of tubing (if present)         | none in.   |                     |  |
| Capacity of casing or tubing                  | 1.607 gpf  |                     |  |
| Volume of casing or tubing                    | 3018 gals. |                     |  |
| All depths referenced to wellhead , elev. 453 |            |                     |  |

### Target Depth for Interface

Normally 50 feet above the end of the casing  
or the cavern roof, whichever is shallower

Depth 1774 ft.

### Instrumentation

|              |                |                |
|--------------|----------------|----------------|
| Well         | Test           | Reference      |
| Manufacturer | Paroscientific | Paroscientific |
| Model        | 760-1K         | 760-1K         |
| Serial No.   | 42953          | 42954          |
| Accuracy     | 0.01%          | 0.01%          |
| Precision    | 0.001 psi      | 0.001 psi      |

## Preparation

If the casing of the test well was most recently used for brine production, flush with water to remove any crystallized salt.

Date and time test well was flushed **06/21/99**

Approximate volume in gallons **10,000**

Shut-in period with water in casing **16 hours**

Comments

Second date and time well was flushed

Approximate volume in gallons

Shut-in period with water in casing

Comments

The test well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the casing or annulus.

Date test well was bled back **06/22/99**

Approximate volume in gallons **10,000**

Specific gravity of fluid **1.205**

Comments A slip blind was placed in the surface piping after the well was bled back to prevent leakage out of the wellhead.

The reference well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the tubing or casing.

Date and time ref well was bled back **06/25/99**

Approximate volume in gallons **3,000**

Specific gravity of fluid **1.197**

Comments A slip blind was placed in the surface piping to prevent leakage out of the wellhead.

## Set Interface

|                                |              |
|--------------------------------|--------------|
| Test fluid                     | <b>Water</b> |
| Specific gravity of test fluid | <b>1.000</b> |
| Specific gravity of brine      | <b>1.205</b> |

Calculate maximum permissible injection rate and target pressure differential.

$$\begin{array}{rcl} \text{Capacity of casing} & \text{Allowable} & \text{Maximum inj.} \\ \text{or annulus} & \text{velocity} & \text{rate} \\ \mathbf{1.607 \text{ gpf} \times} & \mathbf{20 \text{ fpm} =} & \mathbf{32 \text{ gpm}} \end{array}$$

$$\begin{array}{rcl} \text{Target interface depth} \times \text{gradient diff.} & & = \text{target pressure diff.} \\ \mathbf{1774 \text{ ft.} \times (1.205 - 1.000) \times 0.433} & = & \mathbf{157.5 \text{ psi}} \end{array}$$

|                            |                 |              |                |               |                |                |
|----------------------------|-----------------|--------------|----------------|---------------|----------------|----------------|
| Date                       | <b>06/26/99</b> |              |                |               |                | change         |
|                            |                 | Time         | Test Well      | Ref. Well     | Diff.          | in diff.       |
| Pressures before injection |                 | <b>08:00</b> | <b>50.819</b>  | <b>57.014</b> | <b>-6.195</b>  |                |
| Pressures during injection |                 | <b>10:20</b> | <b>150.096</b> | <b>58.617</b> | <b>91.479</b>  | <b>97.674</b>  |
| Pressures during injection |                 | <b>12:45</b> | <b>198.890</b> | <b>59.360</b> | <b>139.530</b> | <b>145.725</b> |
| Pressures after injection  |                 | <b>13:05</b> | <b>212.016</b> | <b>59.624</b> | <b>152.392</b> | <b>158.587</b> |

All pressures measured in psia

Calculated final interface depth

$$\mathbf{158.587 \text{ psi} / ((1.205 - 1.000) \times 0.433) = 1787 \text{ ft.}}$$

**Note : Volume of injected fluid was not measured.**

## Temperature Stabilization Period

|                             |              |                |                |               |                |               |
|-----------------------------|--------------|----------------|----------------|---------------|----------------|---------------|
|                             | Date         | Time           | Test Well      | Ref. Well     | Diff.          | change        |
| Start Stabilization         | <b>06/26</b> | <b>13:05</b>   | <b>212.016</b> | <b>59.624</b> | <b>152.392</b> | in diff.      |
| Start of test               | <b>06/28</b> | <b>07:00</b>   | <b>210.724</b> | <b>59.461</b> | <b>151.263</b> | <b>-1.129</b> |
| Total time                  |              | <b>41 hrs.</b> |                |               |                |               |
| (Minimum time is 36 hours.) |              |                |                |               |                |               |

**The observed change in differential pressure does not indicate significant interface movement during this period.**

### Test Period

|               | Date  | Time  | Test Well | Ref. Well | Diff.   | change<br>in diff. |
|---------------|-------|-------|-----------|-----------|---------|--------------------|
| Start of test | 06/28 | 07:00 | 210.724   | 59.461    | 151.263 |                    |
| Inter. press  | 06/28 | 09:00 | 210.655   | 59.411    | 151.244 | -0.019             |
| Inter. press  | 06/28 | 11:00 | 210.483   | 59.432    | 151.051 | -0.212             |
| Inter. press  | 06/28 | 13:00 | 210.409   | 59.457    | 150.953 | -0.311             |
| End test      | 06/28 | 15:00 | 210.309   | 59.401    | 150.908 | -0.355             |

Test Period 8 hrs  
Average pressure change -0.044 psi/hr

Maximum allowable pressure change is 0.05 psi/hr over 8 hours.

If the test was conducted in accordance with the method approved in the USEPA notice published in the Federal Register of August 18, 1989, page 34169-34171 (as amended in Federal Register of November 14, 1989, page 47451) and the rate of pressure change during the test period was less than 0.05 psi/hour, the well has passed the test and demonstrated internal mechanical integrity.

Result : **PASSED TEST**

### Comments

**Test and reference well pressures were read simultaneously during the eight-hour test period.**

Person conducting test: **Craig Kelly  
Production Supervisor  
Cargill Salt  
518 E. 4th St.  
Watkins Glen, NY 14891**

Witnessing field personnel: **None**

### Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for the submission of false information, including the possibility of fine and imprisonment for knowing violations.

Signature of owner/authorized agent :



**Michael J. Schumacher**  
**Solution mining manager**  
**Cargill Salt**  
**916 S. Riverside Ave.**  
**St. Clair, MI 48079**  
**(810) 326-2762**

Attachments :

Field data sheets (1)  
Gauge calibration certificates



## FIELD DATA SHEET

## TEST WELL

13

INSTRUMENT S/N

42953

## REFERENCE WELL

---

16

INSTRUMENT S/N

42954

[illegible]



PAROSCIENTIFIC, INC.  
4500 148th Ave. N.E.  
Redmond, WA 98052  
Tel: (206) 883-8700  
Fax: (206) 867-5407

Customer: CARGILL SALT  
916 S. RIVERSIDE AVE.  
ATTN: MIKE SCHUMACHER  
ST. CLAIR, MI 48079

Date: 01-13-1998

Sales Order: 13745

STATUS REPORT OF INTELLIGENT TRANSMITTER  
-----

Serial Number: 42953  
Model: 760-1K  
Pressure Range: 0 to 1000 psia  
Port: oil filled

Configuration  
-----

VR: 60.05  
SN: 42953  
ID: 01  
BR: 9600  
PT: N  
  
DP: 6  
  
MD: 1  
MC: Y  
  
UN: 1  
UF: 1.000000  
PR: 00238  
TR: 00952  
  
OP: 1050.000  
ZS: 0  
ZV: 17.76171

Calibration Coefficients  
-----

PA: .0085780  
PM: 1.000791  
TC: .6890874  
  
U0: 5.851211  
Y1: -3983.023  
Y2: -12112.38  
Y3: -78361.29  
  
C1: -4132.251  
C2: -206.1299  
C3: 11047.71  
  
D1: .0609788  
D2: .0000000  
  
T1: 29.95307  
T2: .0023395  
T3: 41.01313  
T4: 17.56322  
T5: 564.0273

Prepared by: CME



## CERTIFICATE OF CALIBRATION

TRANSDUCER MODEL: 760-1K  
SERIAL NUMBER: 42953

The Paroscientific transducer(s) identified above has been calibrated and tested with one or more of the following primary pressure standards. All have traceability to the National Institute of Standards and Technology.

### Bell and Howell Primary Pressure Standard

Pneumatic Absolute or Gauge Dead Weight Tester  
Part Number: 6-201-0001, S/N 4034 and S/N 1014

- Piston/Cylinder: 6-001-0002, P2-919/C2-1523, Weight Set 1: 6-002-0002  
Range: 1.5 to 50 psi [10 to 345 kPa]  
Accuracy: 0.010 percent of reading
- ✓ — Piston/Cylinder: 6-001-0002, P2-652/C2-1378, Weight Set 2: 6-002-0002  
Range: 1.5 to 50 psi [10 to 345 kPa]  
Accuracy: 0.010 percent of reading
- Piston/Cylinder: 6-001-0001, P1-949/C1-922, Weight Set 2: 6-002-0002  
Range: 0.3 to 5 psi [2 to 34 kPa]  
Accuracy: 0.015 percent of reading

### DH Primary Pressure Standard

Pneumatic Absolute or Gauge Dead Weight Tester  
Part Number: PG7601 S/N 161

- Piston/Cylinder: S/N 305, Mass Set: S/N 2052  
Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, 0.29 to 50 psi [2 to 345 kPa] gauge mode  
Accuracy: 0.002 percent of reading

### DH Primary Pressure Standard

Pneumatic Gauge Dead Weight Tester, Model 5203, S/N 5557

- Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S/N 3293  
Range: 20 to 1,600 psi [0.14 to 11 MPa]  
Accuracy: 0.005 percent of reading

### DH Primary Pressure Standard

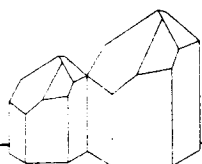
Oil Operated Gauge Dead Weight Tester, Model 5306, S/N 3505

- ✓ — Piston/Cylinder: S/N 3375, Mass Set: S/N 2032  
Range: 40 to 20,000 psi [0.3 to 138 MPa]  
Accuracy: 0.01 percent of reading above 200 psi [1.4 MPa]  
or 0.02 psi [0.14 kPa] at lower pressure
- Piston/Cylinder: S/N 3511, Mass Set: S/N 2032  
Range: 145 to 72,500 psi [1 to 500 MPa]  
Accuracy: 0.02 percent of reading above 725 psi [5 MPa]  
or 0.145 psi [1 kPa] at lower pressure

Tested By:   
Document No. 8145-001, Rev. F 10/17/97

Date: 1-14-98

PAR  
TEST  
14



## CERTIFICATE OF CONFORMANCE

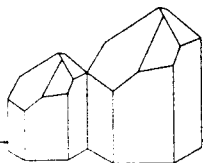
|                   |              |
|-------------------|--------------|
| CUSTOMER:         | CARGILL SALT |
| PURCHASE ORDER:   | S6163        |
| TRANSDUCER MODEL: | 760-1K       |
| PART NUMBER:      | 1107-047-0   |
| SERIAL NUMBER(S): | 42953        |
|                   |              |
|                   |              |

PAROSCIENTIFIC INCORPORATED certifies that the part(s) identified above complies with the requirements of the above order and has been manufactured in accordance with engineering drawings, material and process specifications, testing procedures, and applicable specification drawing of Paroscientific Incorporated. The transducer(s) identified has been calibrated and tested over the specified pressure and temperature range and meets the requirements of the applicable specification drawing. Primary pressure standards and transfer standards used at Paroscientific Incorporated for calibration and testing have traceability to the National Institute of Standards and Technology and are regularly checked and calibrated according to Paroscientific QA Procedure Q8521, Inspection Test and Measurement Equipment, in accordance with the requirements of ISO 9001.

AUTHORIZED SIGNATURE  
Steve Winters, Quality Assurance Manager

1/14/98  
DATE



Digiquartz® Pressure Instrumentation

Document No. T8148, Rev."G", 24Nov97

Page 1 of 2

CERTIFICATION OF TRACEABILITY  
TO  
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Primary pressure standards used in the calibration and testing of Paroscientific pressure transducers have traceability to the National Institute of Standards and Technology through the following documentation.

Bell and Howell Primary Pressure Standard:

Bell and Howell, Model 6-201-0001, Piston/Cylinder P2-919/C2-1523 via DH Calibration Report No. 14480, traceable to NIST via test report numbers TN-249770-92, TN-250722-92, TN-251820-93, MS17/MS23. Weight Set 1, P/N 6-002-0002, via DH Calibration Report No. 14481, traceable to NIST. Weight Set 2, P/N 6-002-0002, via DH Calibration Report No. 14576, traceable to NIST. Piston/Cylinder P2-652/C2-1378 via DH Instruments Calibration Report No. 14575, traceable to NIST. Piston/Cylinder P1-231/C1-384 via DH Instruments Calibration Report No. 13170, traceable to NIST. Piston/Cylinder P/N 6-201, No. P1/949/C1-922, via DH Instruments Calibration Report 14680, traceable to NIST via test reports M1212, TN-251820-93 and 822/255136-95.

DH Primary Pressure Standard, Oil Operated Gauge:

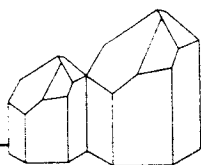
DH Instruments, Model 5306, Piston/Cylinder S/N 3375, via DH Calibration Certificate No. 6167 via National Bureau of Standards Reports TN-251820, TN-250722-92, TN-246108-90 and MS17/MS23. Piston/Cylinder 3511 via DH Calibration Certificate No. 1377 and via NIST reports TN-243399-89, T/N-244408-89, TN-240898, 731/243089, and 523/242160.

DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH Instruments, Model 5203, Piston/Cylinder S/N 4845, via DH Calibration Certificate No. 4473, via National Bureau of Standards Reports TN-249770-92, TN-250722-92, TN-251820-93, and MS 17/MS23. Mass Set S/N 2032/3293 via DH Calibration Certificate Nos. 1029, 1030, 1932, 2871 and via National Bureau of Standards Reports 731/236729-86, SP-8099, P-8218X, 737/23584, 523/242160, TN-249770-92, TN-250722-92, TN-246108-90, and MS 17/MS 23.

DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH instruments, Model PG7601, Piston/Cylinder S/N 305 via DH Instruments Calibration No. 7168, traceable to NIST via test reports M1212, TN-251820-93 and 822/255136-95. DH Instruments 35 Kg Mass Set No. 2052 via DH Instruments Calibration Report No. 7210, via traceable to NIST via test reports M1212, TN-251820-93 and 822/255136-95.



PAROSCIENTIFIC, INC.  
4500 148th Ave. N.E.  
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916 S. RIVERSIDE AVE.  
ATTN: MIKE SCHUMACHER  
ST. CLAIR, MI 48079

Date: 01-14-1998

Sales Order: 13745

STATUS REPORT OF INTELLIGENT TRANSMITTER  
-----

Serial Number: 42954  
Model: 760-1K  
Pressure Range: 0 to 1000 psia  
Port: oil filled

Configuration  
-----

VR: 60.05  
SN: 42954  
ID: 01  
BR: 9600  
PT: N  
  
DP: 6  
  
MD: 1  
MC: Y  
  
UN: 1  
UF: 1.000000  
PR: 00238  
TR: 00952  
  
OP: 1100.000  
ZS: 0  
ZV: .00000000

Calibration Coefficients  
-----

PA: -.0261310  
PM: 1.000610  
TC: .6890862  
  
U0: 5.875855  
Y1: -3967.729  
Y2: -11899.68  
Y3: -77682.61  
  
C1: -3920.350  
C2: 135.0577  
C3: 10907.21  
  
D1: .0585815  
D2: .0000000  
  
T1: 30.13561  
T2: 1.100547  
T3: 42.60255  
T4: 25.11160  
T5: 774.7579

Prepared by: CME



## CERTIFICATE OF CALIBRATION

TRANSDUCER MODEL: 760-1K  
SERIAL NUMBER: 42954

The Paroscientific transducer(s) identified above has been calibrated and tested with one or more of the following primary pressure standards. All have traceability to the National Institute of Standards and Technology.

### Bell and Howell Primary Pressure Standard

Pneumatic Absolute or Gauge Dead Weight Tester

Part Number: 6-201-0001, S/N 4034 and S/N 1014

- \_\_\_\_ Piston/Cylinder: 6-001-0002, P2-919/C2-1523, Weight Set 1: 6-002-0002  
Range: 1.5 to 50 psi [10 to 345 kPa]  
Accuracy: 0.010 percent of reading
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Part Number: PG7601 S/N 161

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Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, 0.29 to 50 psi [2 to 345 kPa] gauge mode  
Accuracy: 0.002 percent of reading

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Pneumatic Gauge Dead Weight Tester, Model 5203, S/N 5557

- \_\_\_\_ Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S/N 3293  
Range: 20 to 1,600 psi [0.14 to 11 MPa]  
Accuracy: 0.005 percent of reading

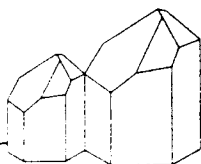
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- ✓ Piston/Cylinder: S/N 3375, Mass Set: S/N 2032  
Range: 40 to 20,000 psi [0.3 to 138 MPa]  
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or 0.02 psi [0.14 kPa] at lower pressure
- \_\_\_\_ Piston/Cylinder: S/N 3511, Mass Set: S/N 2032  
Range: 145 to 72,500 psi [1 to 500 MPa]  
Accuracy: 0.02 percent of reading above 725 psi [5 MPa]  
or 0.145 psi [1 kPa] at lower pressure

Tested By: CLYDE  
Document No. 8145-001, Rev. F 10/17/97

Date: 1-14-98



## CERTIFICATE OF CONFORMANCE

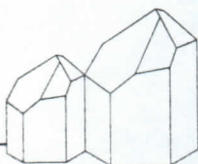
|                   |              |
|-------------------|--------------|
| CUSTOMER:         | CARGILL SALT |
| PURCHASE ORDER:   | S6163        |
| TRANSDUCER MODEL: | 760-1K       |
| PART NUMBER:      | 1107-047-0   |
| SERIAL NUMBER(S): | 42954        |

PAROSCIENTIFIC INCORPORATED certifies that the part(s) identified above complies with the requirements of the above order and has been manufactured in accordance with engineering drawings, material and process specifications, testing procedures, and applicable specification drawing of Paroscientific Incorporated. The transducer(s) identified has been calibrated and tested over the specified pressure and temperature range and meets the requirements of the applicable specification drawing. Primary pressure standards and transfer standards used at Paroscientific Incorporated for calibration and testing have traceability to the National Institute of Standards and Technology and are regularly checked and calibrated according to Paroscientific QA Procedure Q8521, Inspection Test and Measurement Equipment, in accordance with the requirements of ISO 9001.

AUTHORIZED SIGNATURE  
Steve Winters, Quality Assurance Manager

1/14/98  
DATE



Digiquartz® Pressure Instrumentation

Document No. T8148, Rev. "G", 24Nov97

Page 1 of 2



## CERTIFICATION OF TRACEABILITY TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Primary pressure standards used in the calibration and testing of Paroscientific pressure transducers have traceability to the National Institute of Standards and Technology through the following documentation.

### Bell and Howell Primary Pressure Standard:

Bell and Howell, Model 6-201-0001, Piston/Cylinder P2-919/C2-1523 via DH Calibration Report No. 14480, traceable to NIST via test report numbers TN-249770-92, TN-250722-92, TN-251820-93, MS17/MS23. Weight Set 1, P/N 6-002-0002, via DH Calibration Report No. 14481, traceable to NIST. Weight Set 2, P/N 6-002-0002, via DH Calibration Report No. 14576, traceable to NIST. Piston/Cylinder P2-652/C2-1378 via DH Instruments Calibration Report No. 14575, traceable to NIST. Piston/Cylinder P1-231/C1-384 via DH Instruments Calibration Report No. 13170, traceable to NIST. Piston/Cylinder P/N 6-201, No. P1/949/C1-922, via DH Instruments Calibration Report 14680, traceable to NIST via test reports M1212, TN-251820-93 and 822/255136-95.

### DH Primary Pressure Standard, Oil Operated Gauge:

DH Instruments, Model 5306, Piston/Cylinder S/N 3375, via DH Calibration Certificate No. 6167 via National Bureau of Standards Reports TN-251820, TN-250722-92, TN-246108-90 and MS17/MS23. Piston/Cylinder 3511 via DH Calibration Certificate No. 1377 and via NIST reports TN-243399-89, T/N-244408-89, TN-240898, 731/243089, and 523/242160.

### DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH Instruments, Model 5203, Piston/Cylinder S/N 4845, via DH Calibration Certificate No. 4473, via National Bureau of Standards Reports TN-249770-92, TN-250722-92, TN-251820-93, and MS 17/MS23. Mass Set S/N 2032/3293 via DH Calibration Certificate Nos. 1029, 1030, 1932, 2871 and via National Bureau of Standards Reports 731/236729-86, SP-8099, P-8218X, 737/23584, 523/242160, TN-249770-92, TN-250722-92, TN-246108-90, and MS 17/MS 23.

### DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH instruments, Model PG7601, Piston/Cylinder S/N 305 via DH Instruments Calibration No. 7168, traceable to NIST via test reports M1212, TN-251820-93 and 822/255136-95. DH Instruments 35 Kg Mass Set No. 2052 via DH Instruments Calibration Report No. 7210, via traceable to NIST via test reports M1212, TN-251820-93 and 822/255136-95.

